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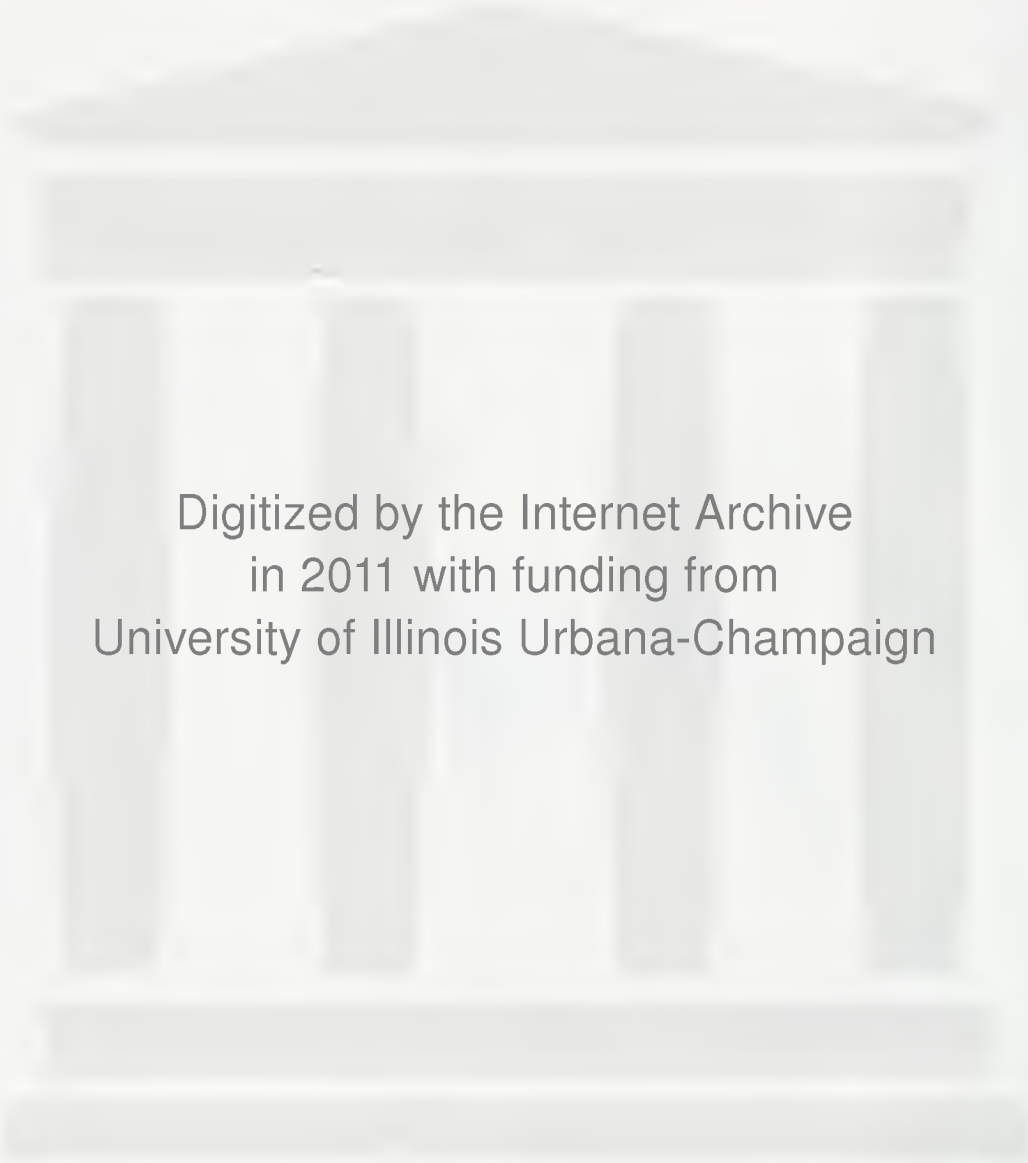
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Faculty Working Papers

MANAGEMENT PERCEPTIONS OF THE WORKING CAPITAL PROCESS

James E. Gentry

#352

College of Commerce and Business Administration
University of Illinois at Urbana-Champaign

FACULTY WORKING PAPERS

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November 2, 1976

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The study of the working capital decision making processes has moved into a phase of expanding interest as evidenced by the works of Knight [13], Krouse [14], Mehta [20], Merville and Tavis [22], and Smith [32]. Until the early 1960's working capital management was treated as an isolated activity of lesser importance than long-range financial planning and was discussed in a static setting with trends in financial ratios being the primary basis for decision making. With the advancement in computer and management science skills, interest in working capital problem solving has escalated. The result has been a variety of models focused on specific working capital activities such as managing cash [1, 2, 11, 16, 24, 25, 35 and 36], extending trade credit [3, 5, 6, 17, 18, 21, 38], reducing inventories [4, 9, 31], reimbursing banks for credit lines and services [26, 37], measuring the cost of short-term sources of funds [15, 27] [19, ch. 14], and integrating different working capital activities [7, 8, 10, 12, 22, 23, 29, 30].

Recent research studies have used a company or industry for modeling specific working capital relationships [11, 26, 35, 37]. This approach limits the applicability of the model because working capital objectives, problems, policies, and activities vary widely among companies and industries, and across international boundaries. Also company size, type of production, size and growth of markets, market share and seasonality have a significant effect on working capital decisions. If an operational theory of working capital management is to evolve, a deeper understanding of the complexities in the total working capital decision making process is needed. Neither the working capital process nor the relative importance of working capital objectives, problems, policies or activities have been systematically studied. Because of this gap in our knowledge, a survey of management perceptions of the working capital process in large industrial corporations in the United States was completed.

The objectives of this paper are to report and analyze the major findings of the survey. The analysis will provide interpretations of the working capital process and insights to management. The first task of the study is to present the methodology of the survey. Next is an evaluation of the perceived tradeoff between liquidity and profitability. The third feature is an analysis of working capital objectives, problems, policies, and activities of large industrial companies. Fourth, a company's internal communications network is compared to the reliability of their cash flow forecast. Finally, there is an evaluation of specific operating systems for managing various activities.

METHODOLOGY

Several executives were interviewed concerning the working capital decision making process in their firm. These interviews plus the financial literature provided the background for designing a questionnaire to study management's perception of the working capital process. The staff at the Survey Research Laboratory at the University of Illinois assisted in the design of the questionnaire. The questionnaire was pretested and the executives involved in the pretest were interviewed concerning the testing instrument being used.

It is recognized that the management of working capital varies substantially among industrial, utility, transportation, and service industries. Resource limitations made it impossible to study each of these industry groups, therefore, it was decided to use the 1974 Fortune 500 manufacturing companies as the universe of companies

Because working capital decision making is present in all areas of a corporation, it was essential to acquire responses from top management in the areas of production, marketing and finance. Thus, four questionnaires were sent the Treasurer of each company. The Treasurer was asked to complete one questionnaire and to have the controller and an executive from production and marketing to

complete a questionnaire. A postpaid envelope was enclosed to return the questionnaires.

There were three mailings to the Fortune 500 companies between the period December 1974 and March 1975. The final questionnaire was returned in May 1975. We received 460 responses from 217 companies in the United States, an average of 2.12 responses per company. The companies that responded represented 43.4 percent of the Fortune 500 companies and 48 percent of the total 1974 sales of the 500 companies. Additionally 15 percent of the companies declined to participate and the remainder of the companies did not respond. The data were processed by the Survey Research Laboratory.

LIQUIDITY AND PROFITABILITY

The tradeoff between liquidity and profitability is a concept frequently used in working capital management, e.g., [32, 34, 35, Ch. 16]. The tradeoff assumes management wishes to substitute higher earning but less liquid assets for lower earning but more liquid assets. In theory liquidity is assumed to be the ability to convert an asset rather quickly into cash with a minimum change in price. Although this is the correct theoretical definition, it is not operational because liquidity has many dimensions. Management is interested in the interpretation of several different measures of liquidity, e.g. the ratio of cash plus marketable securities to current liabilities, unused lines of credit as a percent of total short term debt, the ratio of short term debt to total debt, total financial liquidity[1] and funds flow analysis. Each measure provides unique information concerning a company's liquidity status. In this paper, liquidity is assumed to be cash or its equivalent and profitability is the rate of return on total assets.

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[1] Total financial liquidity equals the algebraic sum of the change in liquid assets plus the change in short term debt, excluding accounts payable, minus the change in net trade credit.

If cash and marketable securities earn a lower return than the remaining assets, and if the goal of management is to maximize the long-run value of the equity, then one objective would be to minimize the holdings in liquid assets. Thus it is frequently assumed there is a *negative* relationship between liquidity and profitability. How do managers of large industrial corporations in the United States perceive this relationship?

The following question was posed to determine management's perception of their company's profitability and liquidity.

> Relative to other companies in your industry how would you rate your company's current. . .

	High	Above Average	Average	Below Average	Low
a. Profitability? (Net income/total tangible assets)					
b. Liquidity? (cash or its equivalent)					

If executives indicate their corporate profitability is greater than the industry and liquidity is less than the industry or vice versa, they are indirectly indicating a tradeoff relationship between liquidity and profitability.

A summary of the responses to the above questions are found in Table 1. They are reported as adjusted on the basis of the sample size for each question. The data indicate there is a *positive* relationship between profitability and liquidity and regression analysis shows this linear relationship was highly significant. Over 60 percent of the respondents rated their corporate liquidity and profitability as being at least above their industry average. Additional tests showed there was no difference in the liquidity and profitability ratings among the four managerial groups. Thus the responses indicate high profitability

TABLE 1

ADJUSTED FREQUENCY RESPONSES TO THE
RATINGS OF PROFITABILITY AND LIQUIDITY

(In Percent)

	Profitability (n = 447)	Liquidity (n = 444)
High	19.7	22.8
Above Average	43.0	37.8
Average	26.8	27.7
Below Average	8.5	9.9
Low	2.0	1.8

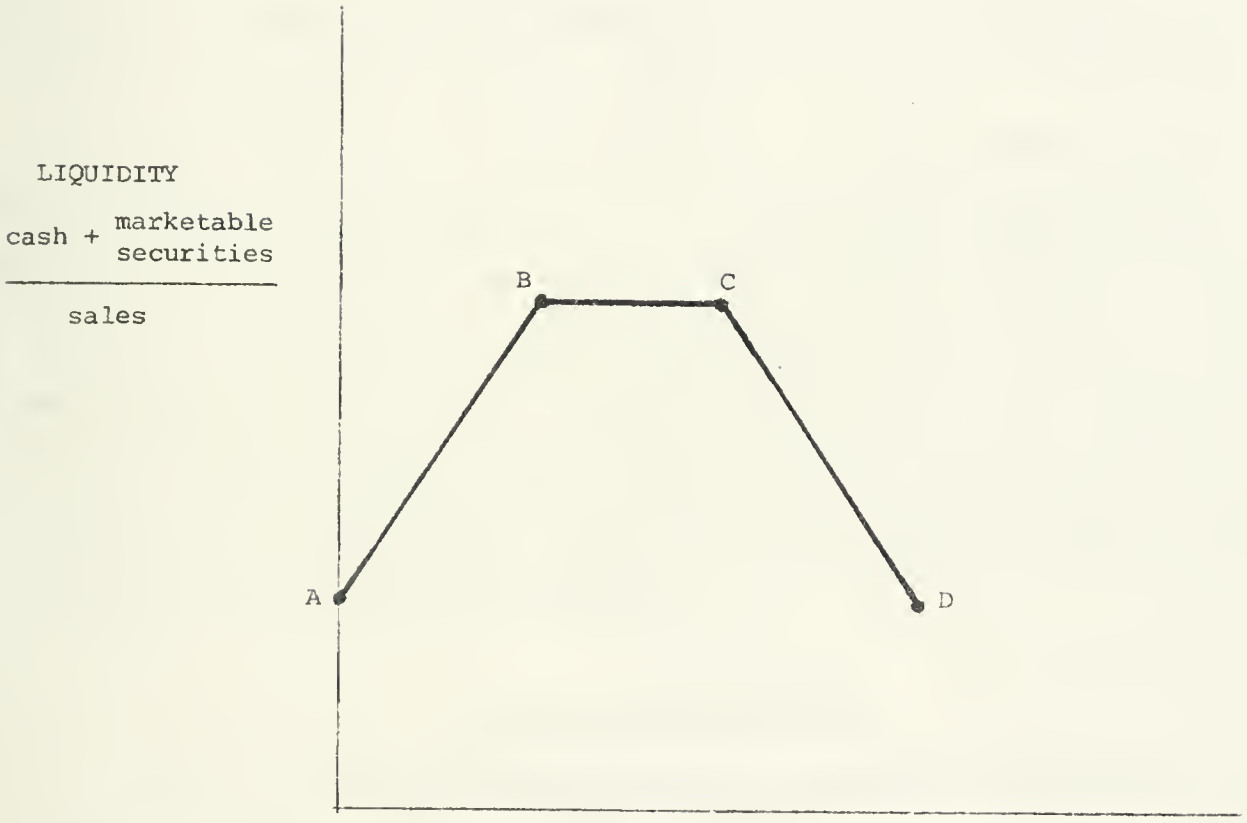
and high liquidity are closely related as are low profitability and low liquidity. Because this finding is opposite the hypothesized relationship, the following observations are offered as an explanation of this anomaly.

Since the mid-1960's there has been a general weakening of corporate financial strength [40]. For example, liquid assets have been a decreasing percent of current liabilities and/or sales; short-term debt has increased as a proportion of total debt; internal funds have been decreasing as a percent of total investment; and net interest has increased more rapidly than sales. In sum, financial risk has been rising during the past decade. In 1975 many corporations improved their financial strength by rebuilding liquid assets, retiring short term debt, and increasing the flow of funds generated internally. Thus, when answering this question, managers from the most profitable companies recognized their companies were in a relatively stronger liquidity position than others in the industry and so marked the appropriate response. In companies with low profitability, the management was aware of the continued weaknesses of their financial strength and indicated their liquidity position was below average.

There is another plausible explanation of a *positive* relationship between liquidity and profitability. This relationship may not be continuously linear, but rather have the shape of an inverted teacup as shown in Figure 1. Between points A and B in Figure 1 management is uncertain concerning the level and stability of future funds flow and realizes they have insufficient short term borrowing power to offset a liquidity crisis. Therefore, liquidity and profitability move in tandem reflecting a positive relationship. At point B the uncertainty concerning future funds flow and borrowing power are reduced. The result is a leveling off of liquidity and profitability continues to rise modestly. At point C management perceives a substantial increase in the certainty of the future flow of funds and a high degree of confidence in their ability to borrow for the short term. This unique combination of events makes it possible

FIGURE 1

A HYPOTHESIZED RELATIONSHIP BETWEEN LIQUIDITY AND PROFITABILITY



for management to maintain less liquidity for each increment of additional profitability. Thus between points C and D there emerges a negative relationship between profitability and liquidity. A company can shift upward from the AB range to the CD range or because of changes in the economic, social or political environment revert to the AB range from the BC or CD range. If the preceding assumptions are valid, the responding managers implicitly assumed substantial uncertainty in future cash flows and/or limited borrowing capacity or availability and, therefore, were scattered along the AB line. This appears to be a realistic assumption for the first six months of 1975.

Perhaps there are other explanations for the *positive* relationship. It is possible the respondents answered the two questions independently, therefore inferences concerning the slope of the relationship between liquidity and profitability are meaningless. However, the pretest survey results and follow-up interviews showed the managers were aware of the tradeoff. In conclusion, the causes of the positive relationship between liquidity and profitability are not clear, but the evidence strongly supports the notion that the tradeoff was positive at the time the survey was completed.

WORKING CAPITAL OBJECTIVES

There is not a consensus among academics or managers concerning the objectives of working capital management, [32]. In interviewing managers from several corporations, their perception of the objective(s) of working capital management varied widely. A few managers perceived working capital management occurred in a static environment and involved a series of separate activities, e.g., the management of cash, receivables, short-term financing, or inventories. The decision making models that reflect this view have as their objective to either minimize the cost or maximize the return of a single process.

At the other extreme, working capital decision making is envisioned as a

complex dynamic process occurring in an uncertain environment. This approach assumes the various working capital activities are integrated into the strategic financial planning process of the company and the objective is to maximize the long-run value of the common stock. Finally, a few managers interviewed suggested working capital objectives were generally not stated, but they operated with a set of multiple objectives which periodically shifted in importance.

To identify the perceived objectives of working capital management, corporate managers from large industrial companies were asked to respond to the following question:

> The following is a list of working capital management objectives. For your company, which of these objectives would you consider the...
>
> a. most important?
> b. second most important?
> c. least important?

The working capital objectives were classified into four separate categories --- *supporting sales*, *financial mobility*, *minimizing* the size of short-term assets and liabilities, and *maximizing* the returns from working capital investments. The four objectives are reported in Table 2. Also presented in Table 2 are the distributions of the responses to the most important, second most important, and least important working capital objectives. Several significant observations emerge from Table 2.

Of the 442 respondents, 56 percent indicated *supporting sales* was the most important working capital objectives, i.e., to provide the cash, accounts receivable, inventories and short-term credit necessary to support the anticipated sales in a defined planning period. Another 20 percent selected this objective as the second most important. Thus, 77 percent of the managers found supporting sales to be at least the second most important objective.

Table 2 shows 21 percent of the managers rated *minimizing* the size of short-

TABLE 2

RESPONDENTS RATINGS OF THE MOST IMPORTANT, SECOND MOST IMPORTANT AND LEAST IMPORTANT WORKING CAPITAL OBJECTIVES

Objectives	PERCENT OF TOTAL RESPONSES: Most Important (1)	Second Most Important (2)	At Least Second Most Important (3)=(1)+(2)	Least Important (4)
Number of Responses	443	441		437
1) Supporting Sales: To provide the cash, accounts receivable, inventories and short term credit necessary to support the anticipated sales in a defined planning period.....	56.4	20.6	77.0	5.9
2) Financial Mobility: To provide a financial buffer in order ot minimize the effect of surprises in sales of materials, production, labor, credit, and transportation.....	6.5	26.8	33.3	43.4
) Minimization: To minimize the balances in cash, receivables, inventories and short term debt.....	21.7	27.0	48.7	25.3
) Maximization: To evaluate changes in each current asset as an investment decision and to minimize the cost of short term credit.....	15.4	25.6	41.0	25.3
TOTAL	100.0	100.0		100.0

term assets and liabilities as the most important objective. As indicated earlier, the *minimization* concept is the objective of many decision making models related to speci ic working capital acti ities. Additionally, *minimization* was selected as the second most important objective by almost 27 percent of the managers. These two observations give reasonably strong support to the idea that *minimization* of the size of short-term assets and liabilities is the second most important working capital objective.

Objective 4 assumes management prefers an optimal allocation of its working capital resources and perceives working capital decisions as trying to *maximize* the return on short-run investments. Only 15 percent of the managers rated the *maximization* objective as the most important, but 41 percent rated it to be at least the second most important working capital objective.

Financial mobility [7] is widely accepted as a comprehensive objective of financial management. Do managers perceive an objective of working capital management is to provide a financial buffer for minimizing the effect of an unexpected decrease in net cash flows? Only 6 percent of the respondents rated the *financial mobility* objective as the most important, while almost 43 percent selected it as the least important of the four alternative objectives. Surprisingly, *financial mobility* is perceived as the least important working capital objective by corporate managers.

Although there was not complete agreement among the corporate managers concerning the single most important objective of the working capital management process, there is, however, a general consensus that *supporting sales* is the most important objective. Management perceives there is a mix of multiple objectives involved in managing working capital. In fact a fixed hierarchy of

objectives does not exist, but rather a flexible combination of objectives underly the accomplishment of the desired task. One could imagine the objective of *supporting sales* as being composed of minimizing the size of working capital accounts, maximizing the return on the working capital investment-financing package and buffering against a serious decline in net cash inflow Nevertheless, each of these three objectives is also independent. Thus *supporting sales* can be interpreted as the most important objective of the four presented.

PROBLEMS, POLICIES AND ACTIVITIES

Problems

It is widely accepted that over time there evolves a broad range of working capital problems, but the importance of the several problems has not been previously studied. Therefore, corporate managers were asked to rank a set of working capital problems. The question posed was:

> The following is a list of problems encountered in the management of working capital. For your company, which of these problems would you consider the . . .
>
> most important?
> second most important?
> third most important?
> least important?

The problems and a summary of the findings are presented in Table 3. *Forecasting sales* was rated the most important working capital problem by 37 percent of the executives while over 50 percent rated it at least second most important. Substantially below the number one problem, the ratings were quite close for three other forecasting problems. They were forecasting the use and/or cost of materials and supplies, forecasting the outflow of cash and forecasting the inflow of cash. Contrary to traditional belief, forecasting the outflow of cash was considered more of a problem than forecasting cash inflow. The rapid increase in

TABLE 3

ADJUSTED FREQUENCY RESPONSES TO THE RATINGS OF WORKING CAPITAL PROBLEMS

	Most Important (1)	Second Most Important (2)	At Least Second Most Important (3)=(1)+(2)	Least Important (4)
Number of Responses	440	438		426
(1) Forecasting sales.....	37.3	13.2	50.5	5.4
(2) Forecasting the use and/or cost of materials and supplies.....	18.0	20.8	38.8	8.0
(3) Forecasting the supply of credit.....	1.8	3.0	4.8	29.6
(4) Forecasting the outflow of cash.....	16.1	21.7	37.8	1.4
(5) Forecasting cash inflow.....	16.1	19.9	36.0	3.3
(6) Extension of credit.....	0.5	1.8	2.3	16.2
(7) Collection of short term credit.....	0.9	3.4	4.3	14.5
(8) Managing the production process.....	9.3	16.2	25.5	21.6
TOTAL	100.0	100.0		100.0

raw material prices in 1974 and early 1975 may have influenced the opinions of the corporate executives in ranking forecasting cash outflow a more serious problem than forecasting cash inflow. Thus, the four most important working capital problems were all related to forecasting cash inflows or outflows, and it appears inflationary expectations seriously influenced the ranking assigned by corporate executives.

The respondents clearly differentiated the least important working capital problems from the most difficult. The problems rated least important involved short-run financing and the management of receivables. Table 3 shows corporate managers considered forecasting the supply of credit, plus extending and collecting trade credit as the least important problems in managing working capital. These impressions of the managers more than likely were affected by improved financial liquidity in early 1975. Finally there was no significant difference in the rankings of the problems encountered in managing working capital by the four types of managers.

In summary, the above findings have important implications for future research. Forecasting cash inflows and outflows is a serious problem and substantial resources are required to develop methodologies and techniques for improving the forecasting process. Discovering the causes of the forecasting errors would be a unique finding and result in a more solid framework for for casting cash flows and related working capital movements.

Policies

Working capital policy decisions are the basis of carrying out the specified objectives. The corporate managers were asked to rate the importance of seven working capital policy decisions as to the most, second most, and least important. The seven policy desisions were (1) prices of products, (2) minimum and maximum level of cash and/or equivalent, (3) credit terms and/or credit extension, (4) credit collection, (5) stretching the payment of accounts

payable, (6) inventory valuation and/or inventory control systems, and (7) research and engineering commitments.

Of the seven working capital policy decisions listed, 49 percent of the respondents selected the pricing of products as the most important. Inventory valuation and/or inventory control was selected by 27.5 percent of the respondents as the most important policy decision area. For these two policy decisions there was no difference in the ranking by the four types of managers.

Establishing the level of cash was rated most important by 11.6 percent of the executives. The treasurers, controllers, and marketing managers were in agreement in ranking this policy decision, but the production executives ranked it substantially lower.

Credit collection and credit extension received 16.4 percent and 13.5 percent, respectively, of the responses as the second most important working capital policy decision. The four management groups were in agreement in the ranking of the importance of credit collection, but the production managers were in disagreement with the others concerning the importance of credit collection and credit extension.

Policies related to research and engineering commitments and stretching accounts payable were considered the least important in working capital management. Research and engineering received 40.2 percent of the response and stretching accounts payable 35.7 percent. There was no difference in the ratings of the four types of managers.

In summary, working capital management has its greatest impact in the establishment of policies related to pricing and inventory management. Interestingly, policies related to cash and receivables management were considered to be of much less importance in the management of working capital. Finally, research and engineering commitments and stretching of payables were rated the least important policy decisions. Traditionally, managing working capital has been considered a

financial activity, but, surprisingly, the policies having a financial connotation rated of lesser importance than marketing and production policies. Undoubtedly, the expectation of continued high inflation had an important effect on the ratings. Perhaps a survey at another time might change the assigned weights, but the hierarchy would more than likely remain the same.

Activities

The implementation of working capital policies is dependent on the activities of the staff in the various departments. The respondents were asked to rank the importance of seven activities as to the most, second most, and least important. The seven activities are (1) planning the cash budget, (2) designing sales strategies and product promotion, (3) receiving cash inflow; paying short-term debts; investing cash balances, (4) arranging for short-term borrowing at banks or with trade creditors, (5) planning and scheduling production activities, (6) purchasing of materials and goods, and (7) credit extension and collection.

Although each of the activities received some support as the most important, *planning the cash budget* was ranked the highest by 36.4 percent of the respondents. The responses to the second most important activity were widely disbursed. Planning and scheduling production activities was selected the second most important activity by 19.2 percent of the respondents. Receiving cash inflow, paying short-term debts and investing cash balances received 16.2 percent of the responses for the second most important activity. The remaining alternatives received between 10 and 15 percent of the responses for the second most important activity. The four management sectors were in agreement on these rankings.

The least important activities were designing sales strategies and product promotion (21.9 percent) and short-term borrowing (21.8 percent). An anomaly occurs in the rating of designing sales strategies. It received 18.4 percent

of the responses for the most important activity, which was next-to-the-highest ranking. It is apparent there are varying beliefs concerning this activity.

Conclusion

The survey of working capital problems, policies and activities has shown the process of managing working capital cuts across many managerial lines of responsibility. One of the most important findings of the survey was that managers consider predicting short-run trends in cash flows the central problem in managing working capital. This observation is supported by the discovery that planning the cash budget was the most important working capital activity. Because cash flows are affected significantly by marketing and production policies and activities, management considered these more important than financially oriented policies and activities. In essence, the domain of working capital management is more closely related to forecasting and controlling cash flows than any other managerial activity.

INTERNAL EVALUATION

Communication

One of the most important dimensions in the working capital decision making process is the success of the internal communications network. Because the working capital process is not a simple financial activity, the type and frequency of communications among the major organizational units plays a key role in the management of working capital. Generally, the treasurer manages the inflow and outflow of funds. Thus the treasurer interfaces directly with production and marketing executives. Also, the production and marketing areas are interdependent.

The respondents were asked to rate the internal communications network in the management of working capital between production and marketing, marketing and treasurer, and production and treasurer. Each pair was rated on a five

point scale that ranged from very good to very poor. The responses are summarized in Table 4.

At least 60 percent of the executives considered the communications network among the three groups to be good or very good. The survey shows production and marketing have the best communications network with 74 percent of the respondents registering either a good or very good rating. The interactions involving the treasurer with the marketing and production executives was somewhat lower. The four types of executives were in agreement on each of the ratings.

Although the ratings are high, it is significant to observe that 24 to 38 percent of the respondents rated the internal communications network as ranging from mediocre to low. Additionally, the executives were asked to rate the reliability of their company's predictions related to cash inflows and outflows. One would assume that high reliability in cash flow predictions would be closely correlated with a good internal communications network and low reliability of predictions related to poor internal communications. This was precisely the relationship that emerged from the survey results, and is an important finding for top management because it shows one of the crucial ingredients in the successful management of working capital is a strong internal communciations network.

Evaluation of Management Systems

Corporations have a variety of operating systems for managing various working capital activities, e.g., receiving cash, extending credit, purchasing materials, and forecasting sales. The rating of these various operating systems provides substantial insight concerning management perceptions of the strengths and weaknesses of their existing working capital activities. The respondents were asked the following question:

> Compared to *other* companies in your industry, how would you rate the system your company has for managing the. . .

There were eleven systems rated on a five point scale rating from very good to

TABLE 4

ADJUSTED FREQUENCY RESPONSES TO THE RATING OF THE INTERNAL COMMUNICATIONS NETWORK (In Percent)

	Production and Marketing	Marketing and Treasurer	Treasurer and Production
Very Good	20.9	18.4	13.2
Good	53.3	49.7	48.9
Mediocre	22.2	24.0	28.2
Poor	3.1	7.2	8.6
Very Poor	0.5	.7	1.1
	100.0	100.0	100.0

very poor. The eleven systems and a summary of the responses are found in Table 5. Several observations emerge from Table 5.

First, managers gave very high ratings to the operational activities managed by the treasurer--receipt of cash, investment in short-term securities and the payment and acquisition of short-term debt. However, the treasurers and controllers gave significantly higher weights to all of these systems, except the payment of debt, than did the production and marketing executives. Also the credit management activities received very strong ratings. These two ratings substantiate the earlier finding that cash and credit management are relatively unimportant problems and activities.

Second, the overwhelming majority of the respondents rated each system as good to very good, with a limited number of responses in the poor to very poor categories. The data are skewed in the good and very good categories. It is possible the bias of the respondents is reflected in these questions, and one should not place substantial weight on the responses.

Third, the management of raw materials balances and the process of forecasting sales received the lowest rating. In both cases between 35 and 40 percent of the respondents rated their working capital operating system as mediocre to very poor. This finding supports the earlier observation that indicated forecasting cash flows and inventory management were crucial working capital problems.

CONCLUSIONS

The survey findings are a summary of management perceptions of the working capital process. In trying to capture the broad perspective of working capital management, responses of executives from four areas--controller, marketing, production, and treasurer--were acquired. In only a few cases did the respondents from these four functional areas differ in their answers to

TABLE 5

ADJUSTED FREQUENCY RESPONSES TO THE
RATING OF INTERNAL OPERATIONAL SYSTEMS

(In Percent)

	Very Good	Good	Mediocre	Poor	Very Poor	M
Receipt of Cash	49.2	46.8	4.0			301
Investment in Short-Term Securities	50.7	41.2	8.2			294
Extension of Trade Credit	28.2	57.5	13.6	0.7		301
Collection of Credit Sales	27.5	55.1	16.4	1.0		305
Raw Materials Balances	13.7	47.7	31.3	7.3		300
Production Process	21.5	58.7	18.8	1.0		303
Distribution Process	20.5	59.7	16.8	2.3		303
Payment of Short-Term Debt	44.0	45.1	9.9	1.0		293
Acquisition of Short-Term Debt	49.8	43.4	6.1	0.3	0.3	297
Purchasing Materials and Services	17.9	61.1	17.9	2.7	0.3	301
Process of Forecasting Sales	13.2	51.6	28.3	6.3	0.7	304

the several questions. Thus, in general, it appears that various managerial functions have a similar perception concerning the working capital decision making process.

Several conclusions have evolved from the study.

- Although supporting sales was considered the most important working capital objective, a flexible combination of several objectives best describes working capital operations rather than a fixed hierarchy of several objectives.
- An oft-quoted objective of working capital management is the tradeoff between liquidity and profitability. However, a positive relationship was found to exist between the two dimensions rather than a negative tradeoff. Differences in financial strength among companies and the perceived certainty of future cash flows were offered as explanations of this anomaly.
- The major problem in managing working capital is forecasting of cash inflows and outflows.
- Policies of a financial orientation are less important in working capital management than marketing and production policies because changes in the latter set of policies have a significant impact on cash flows.
- The reliability of cash flow predictability is closely correlated to the quality of the internal communications system within a company. This finding suggests the success of managing working capital is dependent on the company's internal communications system.

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